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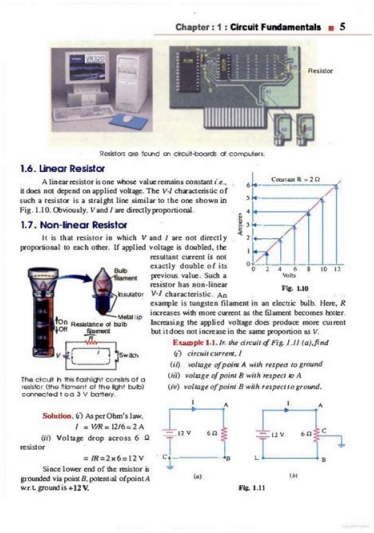

Chapter : 1 : Circuit Fundamentals ■ 5

Resistors are found on circuit-boards of computers.

1.6. Linear Resistor

A linear resistor is one whose value remains constant *i.e.*, it does not depend on applied voltage. The *V-I* characteristic of such a resistor is a straight line similar to the one shown in Fig. 1.10. Obviously, *V* and *I* are directly proportional.

1.7. Non-linear Resistor

It is that resistor in which *V* and *I* are not directly proportional to each other. If applied voltage is doubled, the resultant current is not exactly double of its previous value. Such a resistor has non-linear *V-I* characteristic. An example is tungsten filament in an electric bulb. Here, *R* increases with more current as the filament becomes hoter. Increasing the applied voltage does produce more current but it does not increase in the same proportion as *V*.

Fig. 1.10

Example 1.1. *In the circuit of Fig. 1.11 (a), find*
(i) circuit current, I
(ii) voltage of point A with respect to ground
(iii) voltage of point B with respect to A
(iv) voltage of point B with respect to ground.

Solution. (*i*) As per Ohm's law,
$I = V/R = 12/6 = 2$ A
(*ii*) Voltage drop across 6 Ω resistor
$= IR = 2 \times 6 = 12$ V
Since lower end of the resistor is grounded via point *B*, potential of point *A* w.r.t. ground is +12 V.

Fig. 1.11

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